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ABSTRACT

Indiana University uses audiographic technology to provide off-campus graduate level training to teachers of at-risk and mildly handicapped students in several rural communities of southern Indiana. The At-Risk Program consists of six credits of academic instruction and six credits of supervised practicum focusing on school- and curriculum-based approaches to assessment and instructional program development. Training activities are developed and delivered in partnership with a local group facilitator. Audiographic technology permits simultaneous transmission of voice communication and graphic images across local telephone lines. Audiographics is interactive and provides users with the capability of speaking with one another, sharing text and graphic images, and annotating images displayed on monitors. Graphics can be stored, sequenced, and used as part of large group presentations, small group conferences, and individual reporting and feedback sessions. Multiple user sites can be networked together in a conference call format. The audiographic network permits trainees to scan and transmit samples of their work to the university instructor for review, feedback, further discussion, and evaluation. Trainees complete practicum projects in their own classrooms in school-based teams. Some additional advantages of audiographics are: (1) it is user friendly; (2) the equipment is portable; (3) scanned images can be stored on hard or floppy disks; and (4) instructors at both sites can control equipment functions. This paper contains 13 references. (KS)

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FIELD-BASED PREPARATION OF PRACTICING TEACHERS USING DISTANCE EDUCATION

I. Introduction

An important factor contributing to problems encountered by at-risk and mildly handicapped students in many rural communities is the inadequate preparation of personnel who teach them. Research conducted by Helge (1979, 1983, and 1984), Treadway (1984), and others has shown that instructional and administrative staff of many rural schools are ill-prepared for the responsibilities they encounter in providing educational services to students. Deficiencies often noted are the inability of staff to adequately plan for and teach children with diverse learning and behavioral characteristics; structure building-wide programs to accommodate the needs of students; and adequately use resources and expertise available within schools to improve teaching practices (Lehr & Harris, 1988; Slavin, Karweit, & Madden, 1989). To more effectively prepare school personnel in rural communities to develop educational programs for at-risk and mildly handicapped students, teacher training institutions will need to change the manner in which they structure and deliver training experiences, especially those offered to personnel already teaching in schools (O'Connor and Rotatori, 1987; Pelton, 1983).

Distance education using instructional technology provides the capability of linking universities with rural schools and assisting them in devising new models of personnel preparation (McConnell, 1983; Williamson, 1983). Technology can aid in establishing partnerships between universities and school corporations and support such activities as identifying the needs of personnel, utilizing local resources in training activities, and devising training experiences suited to the demands of the school environment (Keegan, 1983; Knapczyk, 1989). Technology can also facilitate delivery of programs to field sites, support development of on-the-job experiences that improve educational practices, and give access to services and expertise available at universities. Models of distance education that use correspondence courses, on-site instruction by itinerant professors, interactive television, teleconferencing, and other approaches have given training institutions an array of options for developing and delivering programs. This presentation will describe the use of audiographic technology in proving off-campus

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graduate level training to teachers of at-risk and mildly handicapped students in several rural communities of southern Indiana.

II. Overview of Indiana University's At-Risk Program

The At-Risk Program at Indiana University is field-based and offers training to practicing teachers in rural communities who otherwise would be unable to participate in university coursework. The program recruits instructional personnel from selected schools within a region so that training experiences can be adapted to the characteristics of the schools in which the trainees teach. Teams of two-six teachers from schools proximate to one another form cohort groups for the program. About 30 school personnel representing seven schools in two regions of southern Indiana are currently enrolled in coursework.

The program provides a sequence of twelve credit hours of graduate coursework: six credits of academic instruction and six credits of supervised practicum. Coursework is designed to improve the expertise of school personnel who work with at-risk and mildly handicapped students by emphasizing educational practices and methodologies that promote self-reliance and successful performance in regular education settings. The content of the coursework focuses on school- and curriculum-based approaches to assessment and instructional program development. Figure 1 lists the competencies addressed in the program.

Insert Figure 1 About Here

The program also addresses restructuring of both classroom and schoolwide practices and fosters collaboration and collegiality among personnel. Training activities are developed and delivered in partnership with participating school corporations. Local personnel assist in planning training experiences, team teach the academic courses, and take an active part in program evaluation.

The sequence of training experiences is delivered in off-campus regional sites using a distance education model. A two-way communication network is established between Indiana University and the schools. The network uses audiographic technology to assist presentation of coursework, enhance supervision of practicum activities, offer counseling and advisement, and connect trainees with library services and other campus resources. In addition, microcomputers in each of the schools are networked with one another through the university mainframe computer to give trainees access to electronic mail and bulletin board services. Networking schools within a training region allows teachers from different schools to collaborate on training activities, share progress on projects, and provide suggestions for alternate teaching practices.

III. Overview of Audiographic Technology and Its Use in Program Delivery

Audiographic technology permits simultaneous transmission of voice communication and graphic images across local telephone lines. Audiographics is interactive and provides users with the capability of speaking with one another, sharing text and graphic images, and annotating images displayed on monitors. Graphics can be stored, sequenced, and used as part of large group presentations, small group conferences, and individual reporting and feedback sessions. Multiple user sites can be networked together in a conference call format with each site having full interactive capabilities.

The audiographic system used in the teacher training program at Indiana University is one developed by American Telephone and Telegraph (A.T.& T.). The system is comprised of the following components:

A. Quorum Conference Speaker Phones
B. Work Group (WGS) personal computers with VGA boards and high resolution monitors. The computers have hard disc drives and 640KB of memory.
C. Overview Scanners that are desktop devices that capture half- or full-page images. Almost any type of image can be scanned with high resolution, e.g., photographs, charts, hand written documents.
D. SCANWARE communication software package that provides the ability to scan and capture images, transmit images to other locations, display and annotate images on the monitors, and sequence and store multiple images in the form of slide presentations.
E. Bridge Modems that operate at 4800 bps and give the capability of both point-to-point and multi-point communication networking.
F. Printers

Additional components, such as external microphones, large screen monitors, graphics tablets, and audience response devices, are being incorporated into the system to enhance its capacity for training. In addition, audiographics are used in conjunction with less costly telecommunication systems, such as electronic mail and bulletin board networks, to provide a full range of options for large group, small group, and individual teletraining activities.

The audiographic system utilized by Indiana University operates across two sets of dedicated telephone lines. One line is used for voice transmission and other links computer terminals.

IV. Structure and Delivery of Academic Coursework

Academic courses cover methods for assessing and teaching at-risk and mildly handicapped students. They are delivered in off-campus regional sites that are proximate to the schools in

which trainees teach. Teachers enrolled in the courses commute to the regional sites and participate in weekly class sessions in groups of 10-20 trainees.

Instruction is presented in a co-teaching arrangement. One trainee from the cohort group is hired by Indiana University to serve as an on-site field trainer for the courses. The field trainers act as group facilitators for the sessions, coordinate class activities, oversee practice exercises, and monitor group projects. A university-based faculty member administers and supervises the course, organizes the content of the classes, prepares training materials, and participates in class presentations by means of the audiographic link.

Before each course meeting, graphic materials are prepared for the class presentation. Instructional materials can include notes, outlines, figures, charts, or other graphics. The materials are scanned, sequenced, and stored as a slide presentation that corresponds to the topics covered in the class. Materials are transmitted to the regional site through the audiographic network and previewed by both instructors. Plans are made for incorporating materials into instructional lessons, group discussions, exercises, and other class activities and preparations for the session are finalized.

An audiographic link-up between Indiana University and the field sites is established and maintained during the class meetings. The link-up permits two-way voice and graphic interaction during lecture and discussion activities. The software communication program allows both instructors to control the slide presentation and display course materials to conform to the pace of instruction. Depending upon the structure of the class, responsibility for presenting materials and monitoring discussions can be assumed by the university instructor, the field instructor, or shared by both.

Additional in-class exercises, small and large group projects, and similar activities have been devised for each class session to promote application and synthesis of concepts. The audiographic network between sites permits trainees to scan and transmit samples of their work to the university instructor for review, feedback, further discussion, and evaluation.

At the completion of the class meetings, the university and field instructor use the audiographic network to review the day's activities and assess the progress of the trainees. Preliminary plans for the next course meeting are then made.

V. Delivery and Supervision of Practicum Projects

Once trainees have mastered the basic principles that form the content of an academic course, they participate in a semester long practicum experience. The function of each practicum is to give trainees opportunities to apply the principles to the demands of their teaching positions and learn to adapt them to the conditions of their work environment. Thus, trainees complete practicum projects within the context of their own classrooms and

school buildings. Projects are collaborative in nature and trainees work together on them as school-based teams.

Practicum activities are coordinated and supervised by the university-based instructor. To assist in carrying out and monitoring practicum experiences, the university instructor prepared written guidelines for the projects. The guidelines include a sequential listing of components steps involved in completing the projects, description of outputs that trainees produce for the activities, and description of supervisory feedback trainees can expect to receive for the steps. The instructor also assists planning and scheduling practicum activities and oversees and evaluates each group's performance. Since activities completed during practicum correspond to procedures addressed in the coursework, trainees and their supervisor know beforehand what their projects will accomplish.

Audiographic technology is used during practicum experiences to enhance monitoring and supervision of practicum activities in the off-campus school sites. By means of the audiographic network, trainees can receive feedback about their performance with very little delay. For example, about every week, the university-based instructor establishes a voice and graphic link-up with the school-based teams and reviews each group's accomplishments. As progress reports are presented, documentation of work completed can be scanned and transmitted to the instructor. Transmissions can take the form of hand written notes, student work samples, charts, tables, or other graphic format that trainees use to report their progress. Materials can be displayed on the monitor or printed if hard copies are needed. Thus, while trainees make verbal reports of their activities, the instructor can review the documentation and indicate areas that require elaboration or clarification. Approval, suggestions for revisions, editorial comments, or other feedback can then be provided by the supervisor. Audiographics allows both trainees and the instructor to highlight features in the materials using the computer keyboard, a graphics tablet, or a mouse. Notes can be added to the materials or they can be modified, re-scanned, and re-transmitted. Thus, documents can be revised on-line, if desired.

VI. Incorporating Audiographic Technology in Distance Education of Teachers

Audiographics can give teachers in rural communities access to university level training when more conventional forms of distance education are not available to them. For example, many school corporations in southern Indiana cannot easily be reached by video broadcasts from Indiana's educational television system. Through audiographic technology, Indiana University can network with schools in these districts using local telephone service. There are several other features of audiographic technology that make it appealing for distance education of teachers. Some of the features described below are adapted from a report on the

use of audiographics in the corporate environment prepared by Chute and Balthazar (1987).

1. Audiographics is a user friendly technology. Establishing voice and graphic connections between sites can be easily and quickly learned. By following a few simple commands, the major functions of scanning, storing, and transmitting images are quickly performed. The ease of using audiographics is particularly important in teacher training activities because many school personnel have neither the time nor the expertise needed to become proficient in using more complex communication systems.

2. The equipment that supports audiographics is portable and easily moved to different sites. Given the current costs of audiographic technology, it is likely that teacher training institutions, rather than local school districts, will purchase the equipment. This will be true especially for those universities serving small rural school corporations. Portability of the equipment and its availability for use in multiple training sites can improve the cost effectiveness of audiographics.

3. Scanned images can be stored on both hard and floppy discs. Thus, a large number of graphic images can be prepared, scanned, sequenced, and stored for use at a later time. Slide presentations for several classes or an entire course can be set-up well in advance. By storing class materials on floppy discs and mailing discs to the field sites, on-line transmission costs can be significantly reduced.

4. Instructors at both the origination and receive sites can control all equipment functions. For example, university-based faculty can scan, sequence, and load a slide presentation for a class onto the computer at the field training site using local telephone lines. University or field instructors can proceed through the slide presentations at a pace that suits the progress of the class.

5. Audiographics enable users at each site to interact with one another on both an audio and visual dimension. Not only can university-based instructors transmit images to trainees, but trainees can transmit work samples, outlines, reports, and other materials to instructors for review and feedback. The ability to scan and annotate images on-line at each site makes audiographics particularly useful for monitoring class discussions and small group activities, supervising individual practicum projects, and other training experiences where two-way communication of graphic materials is an essential element of instruction.

6. During class meetings audiographics provide users with several options for communicating with one another. Users at any site can give responses verbally or annotate images by means of the computer keyboard, graphics tablet, or mouse. This feature allows instructors to highlight key points in a presentations or make corrections and modifications in the course materials. Trainees can make responses to presentations verbally or by using the computer keyboard. For example, during a class lecture by

their instructor over a speaker phone, trainees can cue questions or indicate the need for clarification of key points without interrupting the verbal presentation. Furthermore, either the instructor or trainees at another site can use the keyboard or graphics tablet to provide answers to questions or give examples of concepts.

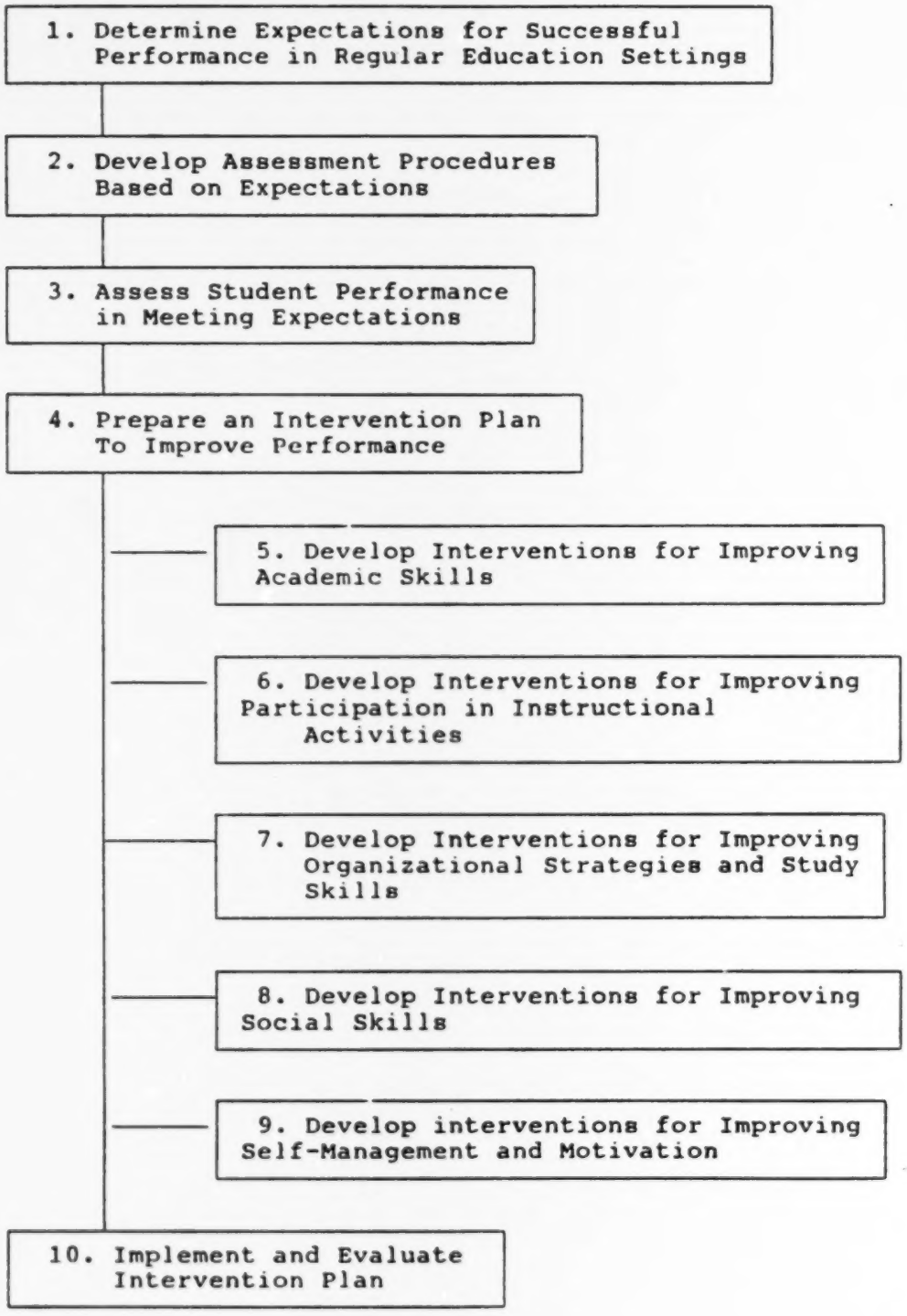
7. Class presentations can be given simultaneously at multiple sites. Although the courses offered by Indiana University currently use a point-to-point network with field sites, it is possible to offer them in a multi-point configuration. This feature of audiographics is especially beneficial in situations where it is not practical for trainees from several schools to commute to a central training site. By using a conferencing bridge, such as the A.T.& T. Alliance Network, up to 59 separate sites could be simultaneously linked together for class presentations.

8. Audiographics also can be used for individually paced instructional activities or for later review of course materials. For example, in situations where trainees are unable to attend class presentations, lectures can be audiotape recorded and graphic materials stored on disc. Trainees can listen to the tapes and review scan course materials at their own convenience.

VII. Summary

Improving the skills of personnel already teaching in rural communities will require universities to develop new approaches for structuring and delivering training programs. The success of the program at Indiana University largely depends upon the partnership established between the university and school corporations in planning coursework and field experiences. Distance education and instructional technology has given Indiana University and participating schools considerable flexibility in organizing and offering a wide range of training experiences adapted to the needs of rural communities.

Figure 1. List of Training Competencies.


1. Determine Expectations for Successful Performance in Regular Education Settings
2. Develop Assessment Procedures Based on Expectations
3. Assess Student Performance in Meeting Expectations
4. Prepare an Intervention Plan To Improve Performance
5. Develop Interventions for Improving Academic Skills
6. Develop Interventions for Improving Participation in Instructional Activities
7. Develop Interventions for Improving Organizational Strategies and Study Skills
8. Develop Interventions for Improving Social Skills
9. Develop interventions for Improving Self-Management and Motivation
10. Implement and Evaluate Intervention Plan

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